Compressed air energy storage in southeastern henan

How can compressed air energy storage improve the stability of China's power grid?
The intermittent nature of renewable energy poses challenges to the stability of the existing power grid. Compressed Air Energy Storage (CAES) that stores energy in the form of high-pressure air has the potential to deal with the unstable supply of renewable energyat large scale in China.

What is compressed air energy storage?
Compressed air energy storage is derived from gas turbine technology,and the concept of using compressed air to store electric energy dates back to the 1940s . The principle of a traditional CAES plant is described as follows (Fig. 1 a).

Should China develop a CAES power plant based on underground air storage?
Based on China's current national conditions,several conclusions are drawn from this review. First,grid-level (100 MW and above) CAES power plants based on underground air storage are the first choicefor developing CAES in China due to its mature technology and available geographical conditions.

Which energy storage technology is most suitable for large-scale energy storage?
Among the available energy storage technologies,Compressed Air Energy Storage(CAES) has proved to be the most suitable technology for large-scale energy storage,in addition to PHES .

How is atmospheric pressure stored in a cryogenic storage tank?
The liquid airof atmospheric pressure is stored in a cryogenic storage tank. During the discharge process,liquid air is pumped into the cold storage/heat exchanger for heating to atmospheric temperature and gasification,and before that the liquid air is already pumped to supercritical pressure by a cryopump.

Can a 10 MW gas pipeline be used for high-pressure air storage?
In 2016,the IET of Chinese Academy of Sciences developed a 10 MW integrated test and validation platform for CAES,where the gas pipeline was adopted for high-pressure air storage(Fig. 9). It has a maximum energy storage capacity of 40 MWh,a power measurement range of 0-10 MW,and a pressure measurement range of 0-10 MPa.

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